COMPUTER SCIENCE TRIPOS Part IB – 2013 – Paper 5

6 Computer Networking (AWM)

(a) Considering either TCP/IP or UDP/IP, write a description of how server-port, client-port, source-port and destination-port relate to each other. You may wish to give examples and use diagrams as appropriate.　　　[4 marks]

(b) What is a routing-loop? Include a diagram in your answer.　　　[4 marks]

(c) Describe a mechanism that prevents routing-loops in Ethernet networks.
　　　[4 marks]

(d) (i) Describe and, with the aid of an example, illustrate the IP Time-To-Live (TTL) mechanism for minimising the impact of routing-loops.　　　[2 marks]

　　　(ii) Assuming, in part (d)(i), a perfect implementation, describe a disadvantage of the approach including the symptoms that might be experienced in a network subject to this disadvantage, and a test that may identify the problem.　　　[2 marks]

(e) Explain the technical and architectural argument behind the decision in IPv6 to retain header TTL but not a header checksum.　　　[2 marks]

(f) Explain why there is ambiguity about handling packets with TTL values of 1 and give a practical solution.　　　[2 marks]